Faculty of Health
Department of Psychology
PSYC 2020 Section D: STATISTICAL METHODS I AND II
Fall-Winter 2023 – 2024
Thursday 2:30pm – 5:30pm
Vari Hall 1152A

This course will be delivered using *a flipped classroom approach*. This approach involves both asynchronous (pre-recorded) and synchronous, <u>in-person</u> components. Students are responsible for watching pre-recorded lectures that deliver instruction of course material. Students are also responsible for attending weekly <u>in-person</u> classes during which they can ask questions about the pre-recorded lecture content and content knowledge will be applied through the completion of learning activities and iClicker questions. Support and feedback will provided from instructor and teaching assistant during in-person class time which will scaffold students' performance on graded course assessments. **Students are expected to have watched the pre-recorded lecture(s) each week before attending the corresponding in-person class.**

For more information about what to expect in a flipped classroom and the benefits of this approach, watch this [2.5 minute video](#)!

Students are expected to spend **an average of 6 to 9 hours per week** on this course, including the time spent watching pre-recorded lectures, attending in-person classes, completing review & practice problems and activities, and biweekly Apply Its. Studying for tests will require additional time around their resepective dates.

Instructor and T.A. Information

Instructor: Dr. Jodi Martin
Office Hours: By appointment (see Contact Teaching Team folder on eClass to book)
Email: jodimart@yorku.ca

T.A.	Udi Alter	Remy Cohan
Email	udialter@yorku.ca	rcohan@yorku.ca
Office Hours	Virtually using Zoom See Contact Teaching Team folder on eClass to book	In person, Sherman 1004 See Contact Teaching Team folder on eClass to book

When sending emails to the teaching team please include "PSYC2020D" in the subject line and your full name somewhere in the email.

Course Prerequisite(s): Course prerequisites or co-requisite are strictly enforced

- HH/PSYC 1010 6.00 (Introduction to Psychology).

Course Credit Exclusions

Please refer to [York Courses Website](#) for a listing of any course credit exclusions.

Course website: [eClass](#)

All course materials will be available through eClass. This includes important details about the course format & schedule, weekly pre-recorded lecture videos & slides, Q&A submissions for each week's class, review & practice problems, Apply It instructions and submissions, and appointment sign-ups for instructor & TA office hours. <u>Important communications from instructor to students will take place through eClass's Course Announcements</u>.

It is absolutely necessary that you regularly access eClass to be successful in this course. "I didn't know it was on eClass" or "I don't know how to use eClass" are not acceptable excuses for missing any course component. It is the students' responsibility to review and become comfortable with using eClass for the purposes of this course.

Course Description

Statistical literacy is an important skill obtained through an undergraduate education in psychology. This course introduces students to the basic concepts of both descriptive and inferential statistics. We will take a hands-on, skills-based approach aimed at facilitating students' understanding of the use and interpretation of various statistical methods. Students will obtain both conceptual and applied knowledge in a range of topics including data visualization, central tendency and variability, probability and sampling distributions, hypothesis testing, and effect sizes as well as both parametric and non-parametric statistical methods. Students will gain hands-on data management and analytic experience working with data by using software (jamovi, R) to run statistical analyses and by interpreting their results.

Program Learning Outcomes

Upon completion of this course, students should be able to:

1. Compute descriptive statistics and inferential statistics.
2. Interpret and report the results of descriptive statistics and inferential statistics.
3. Distinguish between the role of descriptive statistics and inferential statistics.
4. Compute inferential statistics for univariate linear models (ANOVA, regression).
5. Interpret and report the results of inferential statistics for univariate linear models.
6. Recognize the limits of inferential statistics.

Topics Covered

- Defining Key Statistical Terms
- Frequency Distributions
- Central Tendency
- Variability

- z-Scores/Normal Distribution
- Probability
- Sampling Distribution
- Confidence Intervals
- Power
- Effect Size
- Hypothesis Testing
- Correlation (Pearson at minimum)
- χ^2 Goodness of Fit
- χ^2 Test of Independence
- One-sample t test
- Independent samples t-test
- Dependent samples t-test
- Review of basic statistical concepts
- One-way Independent Groups ANOVA (with contrasts)
- Two-way Independent Groups ANOVA (with interaction and contrasts)
- One-way Repeated Measures ANOVA (with contrasts)
- Simple Regression
- Multiple Regression
- *Effect size is included as part of all inferential statistics covered in this course.*

Specific Learning Objectives

1. Compare and contrast descriptive and inferential statistics.
2. Provide examples of the different scales of measurement.
3. Summarize, organize, and present the essential features of different data types numerically and graphically.
4. Calculate relevant descriptive statistics such as measures of central tendency and variability for different types of variables.
5. Generate research questions and statistical hypotheses (i.e., null and alternative) for different research scenarios.
6. Explain the process underlying hypothesis testing and how researchers use this process to test hypotheses and answer research questions.
7. Conduct and interpret the results of various statistical tests using statistical software (jamovi).

8. Demonstrate general knowledge of the software, R, and its use for statistical analysis.

Required Sofware & Recommended Texts

Students are **required** to download the "solid" version of jamovi (version 2.3.28) from www.jamovi.org. This software is required for students to complete activities, Apply Its, and assignments in the course. Students are advised to download this software as soon as possible to be prepared for the start of the course.

Students are also **required** to download iClicker Student (available through the iOS App Store, Google Play Store, or here for non-mobile version) to participate during in-person classes. More information on how to enrol in this course through iClicker Student is available in the "iClicker Participation" folder on eClass.

Students should expect to bring a laptop to most weekly in-person classes in order to complete the applied activities that may require you to use jamovi. If you do not have your own laptop, no worries, you can "buddy up" with someone who does to complete learning activities.

There is no required text for this course. Activities and opportunities for practice will be provided to you in pre-recorded lectures, weekly in person classes, and through eClass. You can consider the following FREE texts available to download online to supplement your learning in the course. **If you use one of these books, keep in mind that all assessments in the course will be based on the content delivered through lectures and classes, not content of the texts** (they are just for additional optional support).

1) https://www.learnstatswithjamovi.com/

> This book covers intro to statistics while also giving a lot of supplemental learning on using jamovi. Although this book goes far more in depth on some topics than is needed for this course, I would recommend it to supplement the application of your learning using jamovi, but also refer to the jamovi materials posted on eClass if you find this book too dense or intimidating.

2) https://open.umn.edu/opentextbooks/textbooks/an-introduction-to-psychological-statistics

> This book covers general conceptual knowledge of statistics.

You can also consider the following options for PAID hard copy or e-books as optional supplemental material for the course, for which you should be able to find used versions:

> 1) Gravetter, F. J., & Wallnau, L. G. *Statistics for the behavioural sciences*. Belmont, CA: Wadsworth, Cengage Learning. (8th edition and beyond should be fine)

> 2) Howell, D.C. (2016). *Fundamental statistics for the behavioral sciences* (9th edition and beyond). Wadsworth Publishing, Cengage Learning.

Please note that if you purchase a textbook thinking it is required you may not be able to return it. Before buying the book, make sure you are aware of the seller's refund policy.

Course Requirements and Assessment:

Assessment	Date of Evaluation (if known)	Weighting
In-class Participation (iClicker)	Weekly	5%
R Tutorials	January 15th	3%
Test 1	October 19th	15%
Test 2	November 30th	15%
Test 3	February 15th	15%
Test 4	March 28th	15%
Apply Its (x8)	Roughly every 2 weeks	32%
Total		**100%**

Description of Assignments

Participation

Students can earn participation points by responding to iClicker questions during weekly in person classes, up to a possible total of 5% of your final grade. All students will get 2 "freebie weeks" per semester, building in flexibility to miss two class' worth of iClicker each semester with no penalty. Completing iClicker questions will provide students important opportunities to check in on their knowledge and understanding of course content and practice in preparation for course tests. More information about using iClicker for this course will be available in the "iClicker Participation" folder on eClass.

R Tutorials

Up to 3% participation points can be earned by completing a series of three (3) online tutorials introducing students to the statistical software, R. Students can earn 1% per tutorial completed. This software is used in upper year undergraduate statistics courses in the department and in many graduate school programs across Canada. Skills in using R are also highly coveted by some employers so can be useful even to those students with no intention of going to graduate school. These tutorials will build on skills and knowledge you will acquire in this course and will prepare you with additional analytical skills for performance in future courses and beyond. Information for accessing the tutorials is posted in the "R Tutorials" folder on eClass.

Apply Its

Students will complete eight (8) Apply Its throughout the course. These are mini assignments that assess students' ability to apply course content to new situations, contexts, and data. **Apply Its can be completed individually or in pairs (groups of 2) should students prefer a team approach.** Completing Apply Its will typically require students to use the statistical software, jamovi to complete new problems that are similar to those completed during in-person classes.

Apply Its are due during a 4-day submission window (see Course Schedule below). The first day of each window is the deadline for a given Apply It and the remaining 3 days are a built-in extension should it be needed; additional extensions will not be provided other than in extreme circumstances. More information will be provided on eClass in the "Apply Its" folder and during in person classes.

Tests

Students will complete four (4) in person tests throughout the course; two in the Fall and two in the Winter. Tests will take place during our scheduled class time. Each test will be non-cumulative based on content from preceding classes and will focus on students' conceptual and interpretive knowledge of statistics. More information about each test will be provided during class time. Students should bring photo ID to each test (preferably a YorkU student card).

Class Format and Attendance Policy

This is an in-person class and cannot be completed asynchronously o entirely virtually. Course content will be delivered through pre-recorded content lectures posted on eClass which students will watch on their own time AND through in-person class held each week. In-person classes will be spent on Q&A about content from the pre-recorded lecture, opportunities to apply course content through learning activities with the instructor and TAs available to provide feedback and guidance, and iClicker practice questions. Students are expected to attend in-person classes to complete this course and should only plan to miss class if otherwise unavoidable (i.e., due to illness).

Students are expected to watch pre-recorded lecture(s) corresponding to each in-person class before the in-person class takes place in order to benefit from the scheduled activities. If an in person class is missed, students are likewise expected to review the material and activities that took place on their own time to ensure the same learning experience**.**

Grading as per Senate Policy

The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, C+ = 5, etc.). Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 89, B+ = 75 to 79, etc.)

For a full description of York grading system see the York University Undergraduate Calendar – Grading Scheme for 2023-24

Missed Tests/Midterm Exams/Late Assignments

Missed Tests

All tests will be completed <u>in person</u>. Student MUST complete the Missed Test form through eClass within 48 hours of the original test date in the event of a missed test. Failure to complete the form within 48 hours of the original test dates will result in a grade of 0 for the missed test. At this time, an Attending Physician's Statement (APS) is not required, however, a reason or explanation for missing a test must be provided and you may provide documentation should you wish to do so.

Once you have notified us of a missed test a TA will contact you with the date of a make up test; **all make up tests will be completed <u>in person</u>**. If you miss the scheduled make up test, you must again completed the Missed Test form with a reason and the weighting of the missed test will be redistributed across the remaining tests in the course. Students can reweight <u>one</u> of the four tests in the course; all students must complete at least three tests to finish the course. It is strongly recommended that you avoid missing tests unless entirely unavoidable to avoid falling behind in the course.

<u>Late Apply Its</u>

Apply Its that are not submitted during their 4-day submission window will receive a grade of 0 and no extensions will be granted, except in extreme circumstances. Apply It deadlines each span a 4-day submission window, which acts as built-in extra time for their completion. This does not mean that the final day of a submission window is the actual deadline, rather, the first date in the window is the deadline and the remaining three days are a built-in extension should it be needed. There will also be class time provided where students can work on their Apply Its.

Add/Drop Deadlines

For a list of all important dates please refer to [Undergraduate Fall/Winter 2023-2024 Important Dates](#)

	Fall (Term F)	Year (Term Y)	Winter (Term W)
Last date to add a course **without permission** of instructor (also see Financial Deadlines)	Sepember 20	September 20	January 22
Last date to add a course **with permission** of instructor (also see Financial Deadlines)	September 28	September 28	January 31
Drop deadline: Last date to drop a course without receiving a grade (also see Financial Deadlines)	November 8	February 8	March 11
Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript – see note below)	November 9 – December 5	February 9- April 8	March 12 - April 8

Add and Drop Deadline Information

There are deadlines for adding and dropping courses, both academic and financial. Since, for the most part, the dates are **different**, be sure to read the information carefully so that you understand the differences between the sessional dates below and the [Refund Tables](#).

You are strongly advised to pay close attention to the "Last date to enrol without permission of course instructor" deadlines. These deadlines represent the last date students have unrestricted access to the registration and enrolment system.

After that date, you must contact the professor/department offering the course to arrange permission.

You can drop courses using the registration and enrolment system up until the last date to drop a course without receiving a grade (drop deadline).

You may [withdraw from a course](#) using the registration and enrolment system after the drop deadline until the last day of class for the term associated with the course. When you withdraw from a course, the course remains on your transcript without a grade and is notated as 'W'. The withdrawal will not affect your grade point average or count towards the credits required for your degree.

Electronic Device Policy

This course requires students to have access to a laptop during in-person sessions in order to work on learning activities using statistical software; students who do not have their own laptop can "buddy up" with a classmate for these purposes. Students will also need access to a computer and Internet connection to watch pre-recorded content lectures through eClass in advance of weekly in-person classes.

Any sharing of screenshots and/or personal feedback received from completing course assessments will be considered a violation of the electronic device policy and there will be consequences for this behaviour. The unauthorized sharing of these details or any other course materials by any means (e.g., What's App group, student forum, Reddit, Facebook group etc.) is strictly prohibited.

Academic Integrity for Students

York University takes academic integrity very seriously; please familiarize yourself with [Information about the Senate Policy on Academic Honesty](#).

It is recommended that you review Academic Integrity by completing the [Academic Integrity Tutorial](#) and [Academic Honesty Quiz](#)

Information on Plagiarism Detection

All submitted work for this course must be completed by the student submitting the work. Any submitted assessments that are suspected to have been completed in part or in their entirety by someone other than the student who submitted the work (including work that has been AI generated) will be considered a breach of academic honesty. For more information on the

university's perspective on AI visit this [website](#), for more information about Senate policies on Academic Honesty see the link in the previous section.

Test Banks

The offering for sale of, buying of, and attempting to sell or buy test banks (banks of test questions and/or answers), or any course specific test questions/answers is not permitted in the Faculty of Health. Any student found to be doing this may be considered to have breached the Senate Policy on Academic Honesty. In particular, buying and attempting to sell banks of test questions and/or answers may be considered as "Cheating in an attempt to gain an improper advantage in an academic evaluation" (article 2.1.1 from the Senate Policy) and/or "encouraging, enabling or causing others" (article 2.1.10 from the Senate Policy) to cheat.

Course Group Chats

Participating in group chats other than the Student Forum on eClass (e.g., What'sApp, Discord, Reddit, SnapChat, etc.) in the interest of forming a course community that is solely for the students is permitted, but students should proceed with caution for the following reasons:

1. The professor, teaching assistants, department and York University overall have no jurisdiction over adverse behaviours (e.g., hacking, bullying, etc.) that may occur in these contexts. That means that it is difficult if not impossible for the professor to intervene if an unsafe situation arises. If such an event occurs, students are advised to shut down the group and form a new one. To reduce the risk of external individuals joining a course chat group please only share links to the group through private means (i.e., don't post the link publicly on Reddit!) and share only with other members of this course.

2. Participation in illicit activity (e.g., cheating) that occurs in such groups may put your academic integrity at risk. Sharing of answers or asking for an answer on graded course components through such a group chat is considered an act of academic dishonesty and is strictly prohibited. Any violations will be reported to the Department of Psychology and are subject to consequences (e.g., a failing grade on the assessment in question, a grade of 0 on the particular assessment, a failing grade in the course, etc.).

3. The sharing of screenshots of emails or answers provided by the professor or other members of the teaching team through emails is not permitted in course community group chats. All email communications between student and professor/teaching team are considered private and should not be shared without express permission from the professor/teaching team.

Academic Accommodation for Students with Disabilities

While all individuals are expected to satisfy the requirements of their program of study and to aspire to do so at a level of excellence, the university recognizes that persons with disabilities

may require reasonable accommodation to enable them to do so. The university encourages students with disabilities to register with Student Accessibility Services (SAS) to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors as necessary. Please let me know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course. https://accessibility.students.yorku.ca/

Excerpt from Senate Policy on Academic Accommodation for Students with Disabilities

1. Pursuant to its commitment to sustaining an inclusive, equitable community in which all members are treated with respect and dignity, and consistent with applicable accessibility legislation, York University shall make reasonable and appropriate accommodations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs. This policy aims to eliminate systemic barriers to participation in academic activities by students with disabilities.

All students are expected to satisfy the essential learning outcomes of courses. Accommodations shall be consistent with, support and preserve the academic integrity of the curriculum and the academic standards of courses and programs. For further information please refer to: York University Academic Accommodation for Students with Disabilities Policy.

Course Materials Copyright Information

These course materials are designed for use as part of the PSYC2020 course at York University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

Copying this material for distribution (e.g. uploading material to a commercial third-party website) may lead to a violation of Copyright law and/or a breach of Academic Honesty. Intellectual Property Rights Statement.

Calumet and Stong Colleges' Student Success Programming:

Calumet and Stong Colleges aim to support the success of Faculty of Health students through a variety of **free** programs throughout their university career:

- Orientation helps new students transition into university, discover campus resources, and establish social and academic networks.
- Peer Mentoring connects well-trained upper-year students with first year and transfer students to help them transition into university.
- Course Representative Program aims to build the leadership skills of its Course Reps while contributing to the academic success and resourcefulness of students in core program classes.

- [Peer-Assisted Study Session (P.A.S.S.)](#) involve upper-level academically successful and well-trained students who facilitate study sessions in courses that are known to be historically challenging.
- [Peer Tutoring](#) offers one-on-one academic support by trained Peer Tutors.
- Calumet and Stong Colleges also support students' [Health & Wellness](#), [leadership and professional skills development](#), [student/community engagement and wellbeing](#), [career exploration](#), [Indigenous Circle](#), [awards and recognition](#), and [provide opportunities to students to work or volunteer](#).
- Please connect with your Course Director about any specific academic resources for this class.
- For additional resources/information about our student success programs, please consult our websites ([Calumet College](#); [Stong College](#)), email scchelp@yorku.ca, and/or follow us on Instagram ([Calumet College](#); [Stong College](#)), Facebook ([Calumet College](#); [Stong College](#)) and [LinkedIn](#)
- Are you receiving our weekly email (Calumet and Stong Colleges - Upcoming evens)? If not, please check your Inbox and Junk folders. If you do not find our weekly emails, then please add your 'preferred email' to your Passport York personal profile. If you need support, please contact ccscadmn@yorku.ca, and request to be added to the listerv.

Course Schedule

Week	Class Date	Topic	What's due when?
		FALL SEMESTER	
Week	**Class Date**	**Topic**	**What's due when?**
1	Sept 7	Course Overview	(suggested BONUS Course Outline Quiz)
2	Sept 14	Introduction to Statistics	(suggested R Tutorial 1)
3	Sept 21	Examining Data: Tables & Figures	**Apply It 1 (Sept 22 – 25)** BONUS Course Outline Quiz due (Sept 22nd @ 11:59pm)
4	Sept 28	Measures of Central Tendency & Variability	(suggested R Tutorial 2 & 3)
5	Oct 5	z-scores & the Normal Distribution	**Apply It 2 (Oct 6 – 10)**
		FALL READING WEEK	
6	Oct 19	**Test 1**	
7	Oct 26	Probability & Intro to Hypothesis Testing	
8	Nov 2	Errors in Hypothesis Testing, Statistical Power, & Effect Size	**Apply It 3 (Nov 3 – 6)**
9	Nov 9	One-sample t-test	
10	Nov 16	Independent & Dependent Samples t-tests	**Apply It 4 (Nov 17 – 20)**
11	Nov 23	Take a mental health day! (NO CLASS)	
12	Nov 30	**Test 2**	

		WINTER SEMESTER	
Week	Class Date	Topic	What's due when?
1	Jan 11	Semester I Review Semester II Preview	
2	Jan 18	One-way ANOVA	**R Tutorials 1- 3 (Jan 15)**
3	Jan 25	Repeated measures ANOVA	**Apply It 5 (Jan 26 - 29)**
4	Feb 1	Factorial ANOVA	
5	Feb 8	Non-parametric tests	**Apply It 6 (Feb 9 - 12)**
6	Feb 15	**Test 3**	
		WINTER READING WEEK	
7	Feb 29	Chi-square Tests	
8	Mar 7	Correlation	**Apply It 7 (Mar 9 – 12)**
9	Mar 14	Linear Regression	
10	Mar 21	Take a mental health day! (no class)	**Apply It 8 (Mar 23 – 26)**
11	Mar 28	**Test 4**	
12	Apr 4	Course wrap up + final iClicker opportunity	